

AN OVERVIEW OF THE MEXICAN GENUS *DIGITACALIA*  
(ASTERACEAE, SENECIONEAE)

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ABSTRACT

A taxonomic treatment of *Digitacalia* is rendered. Five species are recognized, two of these newly described, *D. crypta* sp. nov., from Guerrero and adjacent Morelos, and *D. hintoniorum* sp. nov. of southwestern Michoacán. Illustrations of both are provided. A new variety, *D. jatrophoides* (H.B.K.) Pippen var. *pentaloba* var. nov., from Puebla and Oaxaca is also described. A map showing the distribution of the six taxa is provided.

KEY WORDS: *Digitacalia*, Asteraceae, Senecioneae, México.

In connection with a treatment of *Digitacalia* for the Asteraceae of México (Turner & Nesom, in prep.), I have revised the treatment of Pippen (1968). The results and reasons for my treatment are presented herein.

*Digitacalia* was first proposed by Pippen (1968) and subsequently retained by McVaugh (1984). It is closely related to *Psacalium*, as noted by Pippen, having the white corollas with deeply lobed throats of that genus, but it differs in having robust (1-4 m high), stiffly erect, simple stems with numerous, gradually reduced cauline leaves (vs. well developed basal and lower cauline leaves, those along the middle and upper stem relatively few and much reduced). At maturity, the stems of *Digitacalia* become hollow; those of *Psacalium* are mostly filled with pith and associated tissue at maturity.

Occasional species of the sect. *Palmatinervii* of *Senecio*, approach *Digitacalia* in habit, the most notable being *Senecio ehrenbergianus* Klatt, which has robust simple stems with pinnately lobed leaves which are numerous and rather evenly distributed along the stems. *Senecio ehrenbergianus*, however, has radiate heads with yellow corollas and is presumably properly positioned in sect. *Palmatinervii*.

Pippen (1968) recognized 5 species in *Digitacalia*, including *D. heteroidea* (Klatt) Pippen. Robinson & Brettell (1974) correctly transferred the latter to their proposed genus *Roldana* (= sect. *Palmatinervii* of *Senecio*, sensu Barkley

[1985]). In the treatment that follows, I have combined *D. napeifolia* (DC.) Pippen and *D. tridactylitis* B.L. Robins. & Greenm., thus effectively reducing Pippen's genus to three species, but have raised it again to five species with the description of two new species. In addition, I have recognized two regional varieties within the widespread *D. jatrophoides*. The taxonomy of *Digitacalia* follows.

### *DIGITACALIA* Pippen

Type species, *Digitacalia jatrophoides* (H.B.K.) Pippen.

Stiffly erect perennial herbs to 4 m high, the stems evenly leafy throughout. Leaves alternate, palmately or subpalmately nerved to pinninervate. The blades usually 3-9 lobed, often deeply so. Heads eradiate, numerous in terminal divaricate cymose panicles. Involucres turbinate to narrowly campanulate, calyculate with 1-7 much reduced bracts, the inner bracts equal, 5-8, biserrate but often appearing uniserrate. Receptacles plane, epaleate, alveolate. Florets with white or cream colored corollas, the tube about as long as the limb, the latter with lobes much longer than the throat (except rarely in *D. crypta*). Achenes somewhat fusiform to oblong, glabrous, nearly terete in cross section, ribs 8-10, well defined. the pappus of numerous barbellate bristles in 1-3 series. Base chromosome number,  $x=30$ .

### KEY TO SPECIES

1. Heads 5-6 mm high; pappus 2-3 mm long; Chiapas ..... *D. chiapensis*
- 1' Heads 7-9 mm high; pappus 5-7 mm long: not in Chiapas ..... (2)
  2. Blades of midstem leaves deeply divided, the lobes extending to the midrib or nearly so; margins of lobes entire or rarely with only 1-3 broad teeth ..... *D. jatrophoides*
  - 2' Blades of midstem leaves not deeply divided, the lobes not extending to the midrib; margins of lobes dentate to remotely denticulate (3)
    3. Involucral bracts 5, semisucculent in texture, oblanceolate, broadest well above the middle; Sierra San Felipe, Oaxaca ..... *D. napeifolia*
    - 3' Involucral bracts 6-8, not semisucculent in texture, narrowly ovate to narrowly elliptic, widest at the middle, or nearly so; Michoacán, Morelos, Guerrero ..... (4)

4. Leaves uniformly 3 lobed; pappus bristles white or dirty white, 5-6 mm long; Morelos, Guerrero ..... *D. crypta*  
 4' Leaves 3-5 lobed; pappus bristles rusty brown, 7-8 mm long; Michoacán ..... *D. hintoniorum*

*Digitacalia chiapensis* (Hemsl.) Pippen, Contr. U.S. Natl. Herb. 34:379. 1968.

BASIONYM: *Senecio chiapensis* Hemsl., Biol. Centr. Amer. Bot. 2:238. 1881. TYPE: MÉXICO. Chiapas: without specific locality, 1864-70, Dr. Ghiesbrecht 537 (HOLOTYPE: K; Isotypes: GH!, MO!). *Cacalia chiapensis* (Hemsl.) A. Gray, Proc. Amer. Acad. Arts 19:53. 1883. *Odonototrichum chiapensis* (Hemsl.) Rydb., Bull. Torrey Bot. Club 51:418. 1929.

Pippen (1968) provides an excellent description of this species, albeit based upon only two collections, the type and *Nelson 3467* (GH, US). I have seen the following additional collections; taken together these serve as the basis for the map showing its distribution (Figure 1).

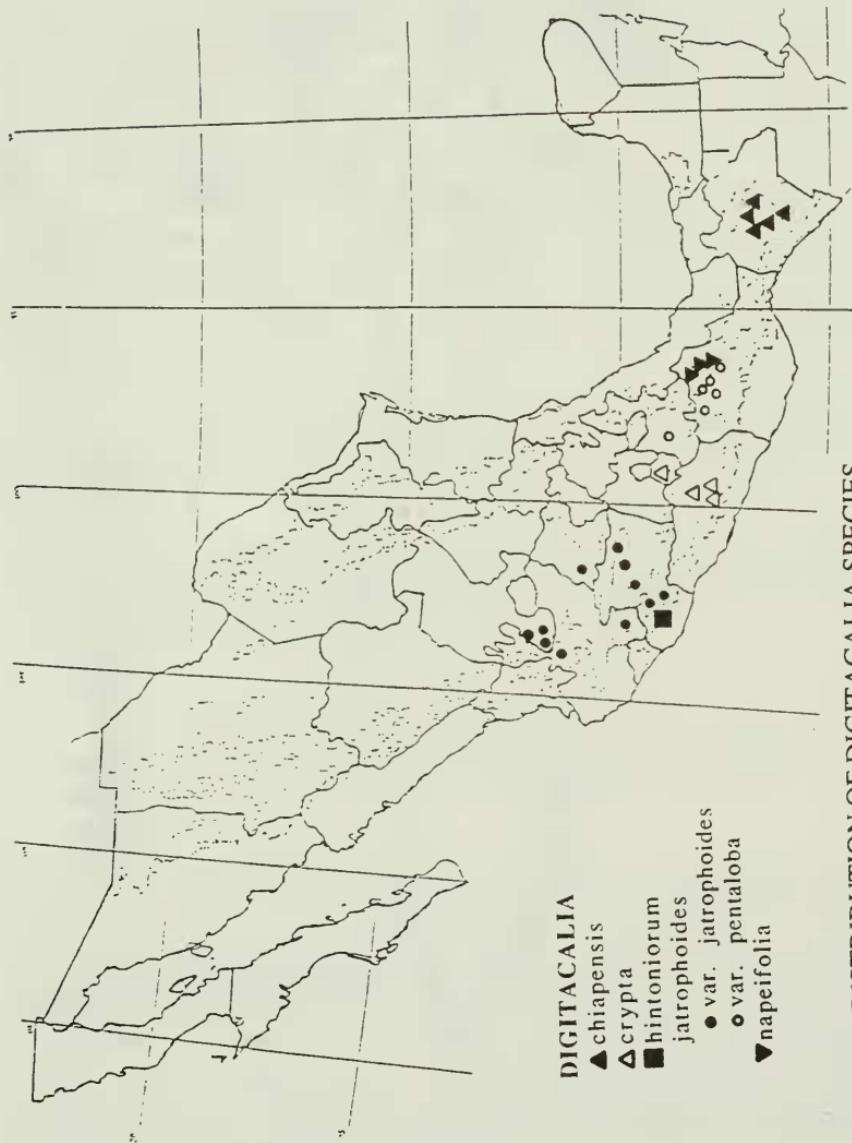
MÉXICO. Chiapas: Mpio. Amatenango del Valle, *Ton 1493* (F, CAS, NY); Mpio. Soyalo, *Breedlove 23342* (NY, TEX). Mpio. Venustiano Carranza, *Breedlove 41140* (CAS, TEX); *Laughlin 1932* (CAS, F).

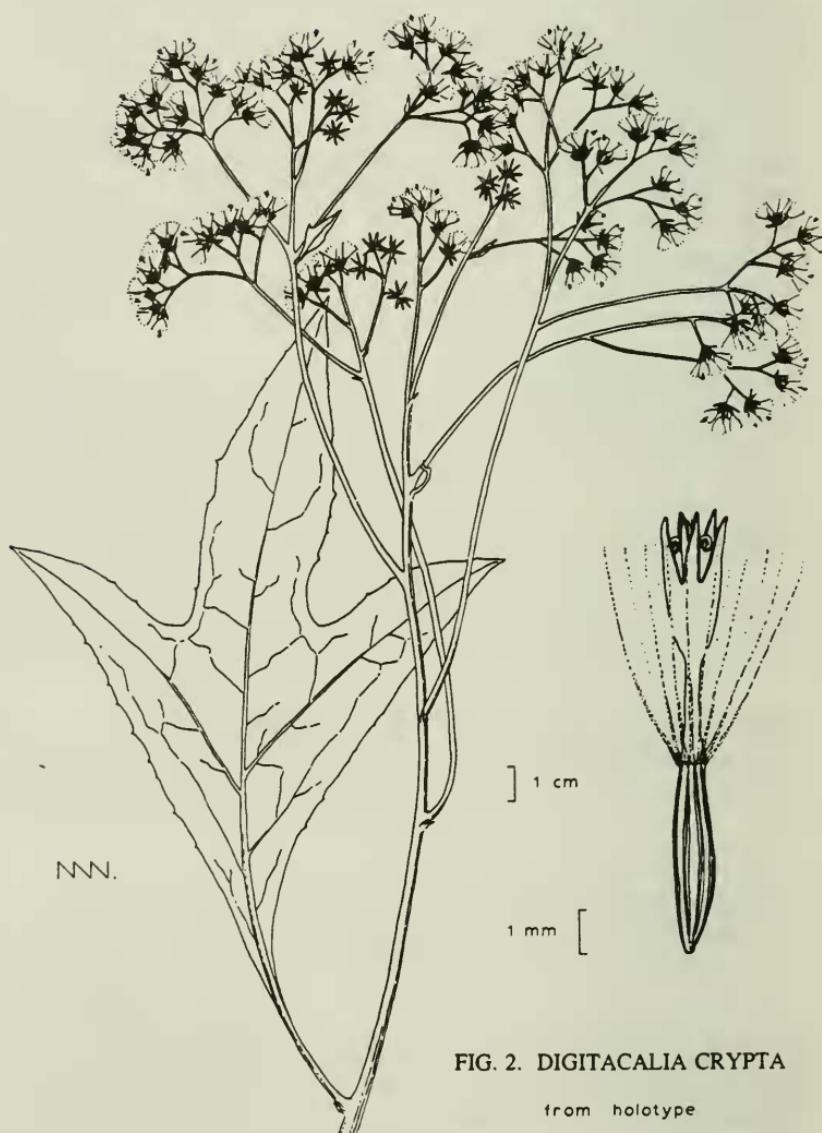
According to label data, the species occurs on mostly dry steep slopes (1700-1800 m) with pine or oak trees and occasional with *Ficus* and *Juniperus*; flowering October-December.

*Digitacalia crypta* B. Turner, sp. nov. Figure 2. TYPE: MÉXICO. Guerrero: Mpio. Chichihualco, km 20 on road from Chilpancingo to Chichihualco, pine-oak zone, 1600 m, 24 Nov 1983, *Fred R. Barrie 722* (HOLOTYPE: TEX!; Isotype: MEXU).

*D. napeifoliae* (DC.) Pippen similis sed foliis aequabiliter trilobatis, petiolis brevibus (1-4 cm longis) partim aialisque, bracteis involucri plerumque 8 (vs. 5), et antheris flavis (vs. atropurpureis) differt.

Stiffly erect, single stemmed suffruticose herb or shrublet 1-3 m high. Stems puberulent, pithy at first but hollow at maturity. Leaves trilobed, those at midstem 10-25 cm long, 8-15 cm wide; the petioles 1-4 cm long, these gradually tapering into the blades, gradually reduced upwards; blades glabrescent above, moderately puberulent below (glabrescent with age), the margins entire or very remotely denticulate. Heads numerous in terminal obpyramidal or ovoid cymose panicles 15-25 cm across. Involucres 4.5-5.0 mm high, the bracts mostly 8, linear lanceolate, glabrous except for the acute ciliate apices. Florets mostly 10 per head, the corollas glabrous, white, ca. 6 mm long, the

FIG. 1. DISTRIBUTION OF *DIGITACALIA* SPECIES

FIG. 2. *DIGITACALIA CRYPTA*

from holotype

tube ca. as long as the limb, the lobes narrow, mostly 2-3 mm long. Anthers pale yellow. Achenes fusiform, 3-5 mm long, glabrous, the pappus of numerous sparsely ciliate, pale tawny bristles 5-6 mm long. Chromosome number,  $n=30$  pairs (based upon *McVaugh 21903*; cf. Pippen [1968]).

ADDITIONAL SPECIMENS EXAMINED: MÉXICO. Guerrero: Cerro del Alquitrin, ca. Petaquillas, SE of Chilpancingo, ca. 1600 m, 22 Oct 1978, *Schwabe s.n.* (TEX); 3 km S of Huitziltepec, ca. 1400 m, 6 Oct 1981, *Torres R. 970* (TEX). Morelos: barrancas near Cuernavaca, 5400 ft, 10 Nov 1895, *Pringle 6164* (CAS, F, GH, MO); Cuernavaca, 11 Nov 1902, *Pringle 9877* (CAS, F, GH, MO, NMC, NY).

Pippen (1968) included this taxon within his concept of *Digitacalia tridactylitis* (= *D. napeifolia* in the present treatment), citing both of the *Pringle* collections from Morelos listed above. In addition, he cited a collection from Guerrero (*McVaugh 21903*) which I would refer to *D. crypta*. The latter taxon was thus effectively hidden within his erroneous concept of *D. napeifolia*, hence the name proposed here.

*Digitacalia crypta* is readily distinguished from *D. napeifolia*, which is apparently restricted to the Sierra San Felipe, Oaxaca, by its uniformly trilobed leaves, ill defined, shorter petioles, smaller heads with more numerous involucral bracts (8-10 vs. 5), and yellow anthers (vs. purple-black).

*Digitacalia hintoniorum* B. Turner, *sp. nov.* Figure 3. TYPE: MÉXICO.

Michoacán: Distr. Coalcomán (Mpio. Chinicula), Villa Victoria, 1500 m, pine forest, 15 Nov 1938, *G.B. Hinton, et al. 12572* (HOLOTYPE: LL!; Isotypes: GH, MICH, NY).

*D. napeifoliae* (DC.) Pippen similis sed foliis profunde palmatis-partitis paginis infernis glabrescentibus, bracteis involucri minus carnosis ad medium latissimisque, et antheris flavis (vs. atropurpureis) differt.

Stiffly erect suffruticose herbs or shrublets 1-3 m high. Stems puberulent to glabrate, hollow at maturity. Leaves up to 25 cm long and 23 cm wide; petioles not winged, up to 10 cm long; blades rounded in outline, about as wide as long, the lobes decidedly serrate, lanceolate, 8-12 cm long, 2-4 cm wide, glabrescent above and below. Heads numerous in terminal cymose panicles, the ultimate peduncles mostly 5-10 mm long. Involucres 4.0-4.5 mm high, the bracts 5, glabrous or nearly so. Florets mostly 5 per head, the corollas white, glabrous, 7-8 mm long, the throat ca. as long as the limb, the lobes 3.0-3.5 mm long. Anthers yellow. Achenes 4-5 mm long, fusiform, glabrous, the pappus of numerous rusty brown ciliate bristles 5-6 mm long.

Pippen (1968) and McVaugh (1984) included this taxon in their concept of *Digitacalia napeifolia*, both citing the above type, and only known collection of

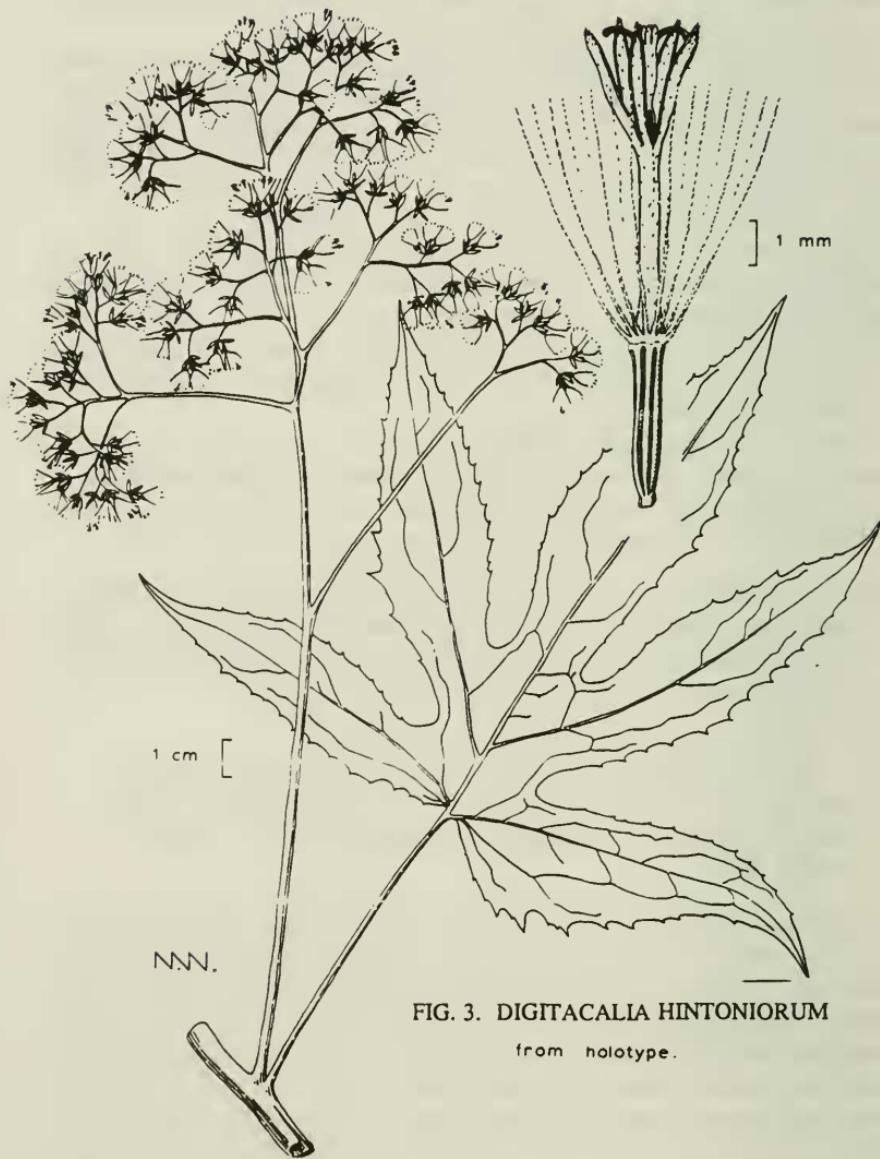


FIG. 3. *DIGITACALIA HINTONIORUM*

from holotype.

*D. hintoniorum*. The latter is readily distinguished from the former by its more deeply palmately lobed leaves, which are glabrescent beneath at maturity, less carnose involucral bracts, which are widest at the middle, yellow anthers, and shorter, rusty brown pappus bristles.

*Digitacalia jatrophoides* (H.B.K.) Pippen, Contr. U.S. Natl. Herb. 34:381. 1968.

Pippen (1968) and McVaugh (1984) have rendered excellent inclusive descriptions of this species, so I will not add yet another. I recognize two regional, seemingly intergrading varieties under this species, as indicated in the following couplet:

Midstem leaves mostly 7 lobed, the rachis (from apex of petiole to base of terminal leaflet) mostly 10-20 mm long; florets 8-10 per head, Zacatecas to Michoacán ..... var. *jatrophoides*

Midstem leaves mostly 5 lobed, the rachis of midstem leaves mostly 1-8 mm long; florets 5-8 per head; Puebla and Oaxaca ..... var. *pentaloba*

*Digitacalia jatrophoides* (H.B.K.) Pippen, var. *jatrophoides*. BASIONYM: *Cacalia jatrophoides* H.B.K., Nov. Gen. & Sp. 4:169. 1820. (Folio ed. 4:132. 1818.) TYPE: MÉXICO. Michoacán: near Lake Cuitzeo. without date, Humboldt & Bonpland 4298 (HOLOTYPE: P; Photoholotype: MO!). *Senecio jatrophoides* (H.B.K.) Schultz-Bip., Flora 28:498. 1845. *Odontotrichum jatrophoides* (H.B.K.) Rydb., Bull. Torrey Bot. Club 51:419. 1924.

*Cacalia digitata* Sessé & Moçiño, Pl. Nov. Hisp. 132. 1889. TYPE: MÉXICO. Michoacán: near Puruandiro. without date. Sessé & Moçiño 2826 (LECTOTYPE Pippen 1968); MA; Photolectotype: F!. Pippen (1968) gave as the type locality, "in Purulandiri Montibus," but McVaugh (1984) cites the locality I have listed here.

ADDITIONAL SPECIMENS EXAMINED. MÉXICO. Guanajuato: *Pringle* 4362 (ARIZ, GH, MO, NY). Jalisco: *Vigueras, et al.* 45 (WIS). Zacatecas: *Breedlove* 61625 (CAS, NY).

In addition to the above cited specimens, Pippen (1968) and McVaugh (1984) cite additional specimens from the area concerned which I have not examined, but these have been included in Figure 1.

This is the more widespread, common variety, occurring from southern Zacatecas to Michoacán, as indicated in Figure 1.

*Digitacalia jatrophoides* (H.B.K.) Pippen, var. *pentaloba* B. Turner, var. nov. TYPE: MÉXICO. Oaxaca: 43 km N of Telixtlahuaca on road to Tehuacán, slope with *Quercus*, *Bursera* and *Dodonaea*, 1680 m, 6 Nov 1983, D.E. Breedlove & F. Almeda 59818 (HOLOTYPE: TEX!; Isotype: CAS).

*D. jatrophoides* (H.B.K.) Pippen var. *jatrophoides* similis sed foliis aequabiliter atque profunde 5-lobatis ad medium caulum, rhachidi laminae plerumque 1-8 mm longa (vs. 10-20 mm), et capitulis flosculis plerumque 5-8 (vs. 8-10) differt.

ADDITIONAL SPECIMENS EXAMINED. MÉXICO. Oaxaca: 10 km N of Huahuapan de León, 1700 m, 30 Oct 1974, Breedlove 39205 (CAS); 12 mi S of Nochixtlán, 27 Jun 1947, Davis s.n. (TEX); Tonaltepec, 39 km S of Cuicatlán, 2 Aug 1985, R. Torres C. & M.L. Torres C. 6939 (MEXU, TEX). Puebla: 16 mi W of El Marques, 21 Aug 1980, Turner 80A-4C (TEX).

The variety is readily distinguished from the typical variety by the characters given in the key. Nevertheless, occasional plants of var. *pentaloba* have characters which approach those of var. *jatrophoides*. According to label data (Torres & Torres 6939), the taxon is a suffruticose herb to 3 m high and is said to be very frequent at the locality cited.

*Digitacalia napeifolia* (DC.) Pippen, Contr. U.S. Natl. Herb. 34:382. 1968.  
BASIONYM: *Cacalia napeaefolia* DC., Prod. 6:328. 1838. TYPE: MÉXICO. Oaxaca: summit of Sierra San Felipe, Jul 1834, G. Andrieux 280 (HOLOTYPE: G-DC, microfiche!; Photoholotype: TEX!). *Senecio napeifolium* (DC.) Schultz-Bip.. Flora 28:498. 1845. *Odontotrichum napeifolium* (DC.) Rydb., Bull. Torrey Bot. Club 51:418. 1924.

*Cacalia tridactylitis* B.L. Robins. & Greenm., Amer. J. Sci. III. 50:159. 1895. TYPE: MÉXICO. Oaxaca: Sierra San Felipe, 6000 ft, 19 Nov 1894, C.G. Pringle 5841 (HOLOTYPE: GII!). *Odontotrichum tridactylitis* (B.L. Robins. & Greenm.) Rydb., Bull. Torrey Bot. Club 51:419. 1924. *Digitacalia tridactylitis* (B.L. Robins. & Greenm.) Pippen, Contr. U.S. Natl. Herb. 34:383. 1968.

Suffruticose herbs or shrublets, 1.0-2.5 m high. Stems glabrous, pithy at first, but hollow at maturity. Leaves 3-7 lobed, often deeply so, those at midstem mostly 5-7 lobed, up to 25 cm long and 25 cm wide, gradually reduced upwards, those below the capitulecence mostly trilobed; petioles to 10 cm long; blades glabrate above, persistently densely puberulent beneath, the margins serrulate to nearly entire. Heads numerous in terminal obpyramidal cymose panicles 20-40 cm across. Involucres 4-5 mm high, the bracts 5, glabrous or with a few ciliate hairs apically; florets mostly 5-6 per head,

the corollas glabrous, cream colored, 8-9 mm long, the tube ca. as long as the limb, the lobes narrow, mostly 3-4 mm long. Anthers blackish purple. Achenes cylindrical, ca. 5 mm long, glabrous, the pappus of numerous ciliate tawny bristles 6-7 mm long.

ADDITIONAL SPECIMENS EXAMINED: MÉXICO. Oaxaca: near summit of highway 175 between Cd. Oaxaca and Tuxtepec, 19 Oct 1986, Barkley & Villaseñor 3907 (KSC, TEX, WIS); Llano de Las Flores, 2800 m, 5 Aug 1981, Lorence 3650 (CAS); 50 mi by road from Valle Nacional, 13 mi S of the first high pass, just below the fir zone, 2850 m, 10-12 Oct 1962, McVaugh 21823 (LL, NY); 2.7 mi S of Llano de Las Flores, near top of pass, 27 Aug 1983, Turner 1519OC (TEX).

Pippen (1968) recognized *Digitacalia tridactylitis* as a good species, distinguishing this from *D. napeifolia* by its trilobed leaves, "the lobes forming an angle, with the midrib, of less than 45 degrees." Leaf shape and lobing is very variable in the *Digitacalia* complex, as indicated in the above description, which is based solely upon collections from Sierra San Felipe, Oaxaca, the type locality for both taxa. Pippen included within his concept of *D. tridactylitis*, specimens from Guerrero and Morelos which I place elsewhere. McVaugh (1984) followed Pippen's treatment, at least in part, citing material from western Michoacán (*Hinton 12572*) as belonging to *D. napeifolia*. The latter collection typifies *D. hintoniorum* in the present treatment.

#### ACKNOWLEDGMENTS

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#### LITERATURE CITED

- Barkley, T. 1985. Infrageneric groups in *Senecio*, s.l., and *Cacalia*, s.l. (Asteraceae: Senecioneae) in Mexico and Central America. *Brittonia* 27:211-218.
- McVaugh, R. 1984. *Digitacalia*, in *Flora Novo-Galicianae* 12:296-299. University of Michigan Press, Ann Arbor.
- Pippen, R. 1968. *Digitacalia*, in *Contr. U.S. Natl. Herb.* 34:378-383.
- Robinson, H. & H. Brettell. 1974. Studies in the Senecioneae (Asteraceae). V. The genera *Psacaliopsis*, *Barkleyanthus*, *Telanthophora* and *Roldana*. *Phytologia* 27:402-439.